

---

**CLIFTON CUNNINGHAM**, University of Calgary

*Geometric construction of characters of  $\mathbb{Z}_p^*$*

Local class field theory (in a very simple case) tells us how to apprehend characters of  $\mathbb{Z}_p^*$  as characters of the inertia group for  $\mathbb{Q}_p$ . In this talk we explain how continuous characters of  $\mathbb{Z}_p^*$  may be identified with certain character sheaves on  $\mathbb{G}_{m, \overline{\mathbb{Q}}_p}$ , using Kummer-Artin-Schreier-Witt theory. We do this by exhibiting group schemes over purely ramified extensions of  $\mathbb{Z}_p$  that determine functors from Kummer local systems on  $\mathbb{G}_{m, \overline{\mathbb{Q}}_p}$  to Artin-Schreier local systems on the special fibre of the group scheme, and then applying the sheaf-function dictionary; this is not Lubin-Tate. Under these functors, local systems of order  $d$  map to continuous characters of level  $\log_p(d)$ . The relation to class field theory for  $\mathbb{Q}_p$  will also be discussed.

Joint with Masoud Kamgarpour and Aaron Christie.